

ABSTRACT OF THE DISCLOSURE

An apparatus and method for generating an edge sidelobe canceling signal and an uplink communication apparatus using the same in an orthogonal frequency division multiplexing access (OFDMA) system. The uplink communication apparatus includes a transmitting terminal. The transmitting terminal includes a signal mapping unit, a serial-to-parallel conversion unit, an edge sidelobe canceling signal generation unit, an inverse fast Fourier transform (IFFT) unit, and a guard interval insertion and parallel-to-serial conversion unit.

The edge sidelobe canceling signal generation unit generates an upper edge sidelobe canceling signal corresponding to an inner product of a transmission signal vector of the transmitting terminal and an optimized upper weight vector and a lower edge sidelobe canceling signal corresponding to an inner product of the transmission signal vector of the transmitting terminal and an optimized lower weight vector and allocates the upper and lower edge sidelobe canceling signals to subcarriers in guard intervals, respectively.